New England Bioassay

A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

77 Batson Drive
Manchester, CT 06042
T: 860.643.9560
F: 860.646.7169
www.nebio.com

NEW ENGLAND BIOASSAY A DIVISION OF GZA
CHRONIC AQUATIC TOXICITY TEST REPORT

Permitee: Pine Brook Country Club NPDES # MA0032212
Report submitted to: 42 Newton Street
Weston, MA 02493
Sample ID: Effluent
Test Month/Year: July 2019
NEB Proj # 05.0752101.00

Test Type / Method: *Ceriodaphnia dubia* Modified Chronic Static-Renewal Freshwater Test Method 1002.0; EPA 821-R-02-013
Pimephales promelas Modified Chronic Static-Renewal Freshwater Test Method 1000.0; EPA 821-R-02-013

Effluent Sample Dates: #1 7/21-22/19 #2 7/23-24/19 #3 7/25-26/19

Test Start Date: 7/22/19

Results Summary

Your results were as follows:

Passed all permit limits

Acute Test Results

Species	LC50	A-NOEC	Permit Limit	Pass / Fail
Ceriodaphnia dubia	>100%	100%	≥ 100%	Pass
Pimephales promelas	>100%	100%	≥ 100%	Pass

Chronic Test Results

Species	C-NOEC	C-LOEC	IC25	Permit Limit	Pass/Fail
Ceriodaphnia dubia	100%	>100%	>100%	≥ 25%	Pass
Pimephales promelas	100%	>100%	>100%	≥ 25%	Pass

Data Qualifiers affecting this test:

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

Test Report Certification

Permittee name:	Pine Brook Country Club	Permit number:	MA0032212
Client sample ID:	Effluent	Test Start Date:	7/22/19

Whole Effluent Toxicity Test Report Certification (Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____ (Date)

_____ Authorized Signature

_____ Print or Type Name and Title

_____ Print or Type the Permittee's Name

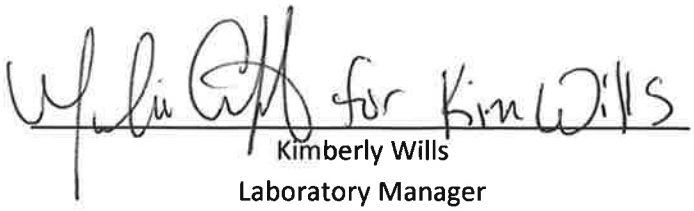
MA0032212 Print or Type the NPDES Permit Number

Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 8/20/19 (Date)



Kimberly Wills
Laboratory Manager
New England Bioassay a division of GZA

General Test Conditions

Permittee name: Pine Brook Country Club Permit number: MA0032212

Client sample ID: Effluent Test Start Date: 7/22/19

Sample Collection Information

Effluent #1 Dates/Times: 7/21-22/19 @ 1338-0908 Receiving Water #1 Date/Time: 7/22/19 @ 0932

Effluent #2 Dates/Times: 7/23-24/19 @ 2347-1006 Receiving Water #2 Date/Time: 7/24/19 @ 0940

Effluent #3 Dates/Times: 7/25-26/19 @ 1030-0900 Receiving Water #3 Date/Time: 7/26/19 @ 0926

Were a minimum of three samples collected? Yes ☑ No ☐ *(see note below)

Were samples used within the first 36 hours of collection? Yes ☑ No ☐ * (see note below)

* sample collection note:

Test Conditions

Permittee's Receiving Water: Pine Brook

Ceriodaphnia dubia

- Dilution water: Laboratory synthetic soft water (hardness 45 - 55 mg/L CaCO3)
- Control water: Receiving water collected at a point immediately upstream of or away from the discharge

Pimephales promelas

- Dilution water: Laboratory synthetic soft water (hardness 45 - 55 mg/L CaCO3)
- Control water: Receiving water collected at a point immediately upstream of or away from the discharge

Effluent concentrations teste 0%, 6.25%, 12.5%, 25%, 50%, 100%

Was effluent salinity adjusted? No ☑ Yes ☐ with Instant Ocean sea salts to _____ ppt

Dechlorination procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method

- Dechlorination was not required

Aeration: Did Dissolved Oxygen levels fall below 40% saturation? Yes ☐ No ☑

Test Aerated at <100 bubbles/minute as of: N/A (for Fathead minnow test only)

TRC results and further information about aeration of samples can be found attached in "sample receipt chemistry"

Reference Toxicant Data

Ceriodaphnia dubia		***Fathead minnows***	
Date:	7/1/19	Date:	7/1/19
Toxicant:	Sodium chloride	Toxicant:	Sodium chloride
Dilution Water:	NEB CTRMH	Dilution Water:	NEB Soft Water
Organism Source:	NEB	Organism Source:	NEB
Reproduction IC25:	1.05 g/L	Growth IC25:	1.52 g/L
Results within range	Yes ☑ No ☐	esults within range	Yes ☑ No ☐

Ceriodaphnia dubia Test Results

Permittee name: Pine Brook Country Club Permit number: MA0032212

Client sample ID: Effluent Test Dates: 7/22/19 - 7/28/19

Test Acceptability Criteria

Lab Diluent Survival:	100 %	Mean Lab Diluent Reproduction:	25.6 young per female
Brook Control Survival:	100 %	Mean Brook Control Reproduction:	16.1 young per female
Thiosulfate Control Survival:	N/A %	Mean Thiosulfate Control Reproduction:	N/A young per female

Presence of an asterisk (*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Results

		Permit Limit	Test Result	Pass/Fail Status
Acute Data	48 hr LC50	≥ 100%	>100%	Pass
	48 hr NOEC		100%	
	TUa			
Chronic Data	Chronic LC50		>100%	
	Survival C-NOEC		100%	
	Survival C-LOEC		>100%	
	Reproduction C-NOEC		100%	
	Reproduction C-LOEC		>100%	
	Reproduction IC25		>100%	
	Reproduction IC50		>100%	
	Reportable C-NOEC	≥ 25%	100%	Pass
	Reportable C-LOEC		>100%	
	MATC		>100%	
	TUc			

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Variability

Reproduction PMSD: 33.6% Upper & Lower EPA bounds: 13 - 47% ☐ Low ☑ Within bounds ☐ High

☐ PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC)

☑ The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.

☐ PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower bound.

- ☐ The RPD values for all concentrations fall below the lower bound. Any differences observed in this test are considered statistically insignificant.
- ☐ Some of the concentrations that were flagged as statistically significant have RPD values that fall below the lower bound. Any differences observed in these concentrations will not be considered statistically significantly decreased from the control.
- ☐ No statistically significant reductions were observed in this test.

Ceriodaphnia dubia Test Results

Permittee name: Pine Brook Country Club Permit number: MA0032212

Client sample ID: Effluent Test Dates: 7/22/19 - 7/28/19

Concentration - Response Evaluation

Survival: #12 No significant effects at any test concentration with a flat concentration-response curve. Test concentrations performed very similarly to dilution control.

Reproduction: #12 No significant effects at any test concentration with a relatively flat concentration-response curve. Test concentrations performed both above and below (but similarly to) the dilution control.

The concentration - response relationship was reviewed and the following determination was made:

Survival	Reproduction	
X	X	Results are reliable and reportable
		Results are anomalous (see explanation below)
		Results are inconclusive - retest (see explanation below)

Results Discussion (if applicable):

Pimephales promelas Test Results

Permittee name: Pine Brook Country Club Permit number: MA0032212

Client sample ID: Effluent Test Dates: 7/22/19 - 7/29/19

Test Acceptability Criteria

Lab Diluent Survival:	87.5 %	Mean Lab Diluent Growth:	0.59 mg
Brook Control Survival:	2.5 %	Mean Brook Control Growth:	0.04 mg
Thiosulfate Control Survival:	N/A %	Mean Thiosulfate Control Growth:	N/A mg

Presence of an asterisk (*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Results

		Permit Limit	Test Result	Pass/Fail Status
Acute Data	48 hr LC50	≥ 100%	>100%	Pass
	48 hr NOEC		100%	
	TUa			
Chronic Data	Chronic LC50		>100%	
	Survival C-NOEC		100%	
	Survival C-LOEC		>100%	
	Growth C-NOEC		100%	
	Growth C-LOEC		>100%	
	Growth IC25		>100%	
	Growth IC50		>100%	
	Reportable C-NOEC	≥ 25%	100%	Pass
	Reportable C-LOEC		>100%	
	MATC		>100%	
	TUc			

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Variability

Growth PMSD: 13.9% Upper & Lower EPA bounds: 12 - 30% ☐ Low ☑ Within bounds ☐ High

☐ PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC)

☑ The PMSD falls within the upper (30%) and lower (12%) bounds. Results are reportable.

☐ PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower bound.

- ☐ The RPD values for all concentrations fall below the lower bound. Any differences observed in this test are considered statistically insignificant.
- ☐ Some of the concentrations that were flagged as statistically significant have RPD values that fall below the lower bound. Any differences observed in these concentrations will not be considered statistically significantly decreased from the control.
- ☐ No statistically significant reductions were observed in this test.

Pimephales promelas Test Results

Permittee name: Pine Brook Country Club Permit number: MA0032212

Client sample ID: Effluent Test Dates: 7/22/19 - 7/29/19

Concentration - Response Evaluation

Survival: #12 No significant effects at any test concentration with a flat concentration-response curve. Test concentrations performed very similarly to dilution control.

Growth: #13 No significant effects at any test concentration with a relatively flat concentration-response curve. Test concentrations performed equal to or better than the dilution control.

The concentration - response relationship was reviewed and the following determination was made:

Survival	Growth	
X	X	Results are reliable and reportable
		Results are anomalous (see explanation below)
		Results are inconclusive - retest (see explanation below)

Results Discussion (if applicable):

TEST METHODS

Ceriodaphnia dubia

Test type:	Modified Chronic Static Renewal Freshwater Test
Test Reference Manual:	EPA-821-R-02-013 "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms"
Test Method:	*Ceriodaphnia dubia* Survival and Reproduction Test - EPA 1002.0
Temperature:	25 ˚C ± 1˚C (Temperatures should not deviate by more than 3˚C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	30 mL (recommended minimum)
Test solution volume:	15 mL (recommended minimum)
Renewal of Test Solutions:	Daily (required)
Age of Test Organisms:	Less than 24 hours; and all released within a 8-h period (required)
Number of Neonates Per Test Chamber:	1 Assigned using blocking by known parentage (required)
Number of Replicate Test Chambers Per Treatment:	10 (required minimum)
Number of Neonates Per Test Concentration:	10 (required minimum)
Feeding Regime:	Fed 0.1 mL each of YCT and algal suspension per exposure chamber daily. (recommended)
Cleaning:	Use new plastic cups daily (recommended)
Aeration:	None (recommended)
Test Duration:	Until 60% or more of control females have three broods (maximum test duration 8 days) (required)
Endpoints:	Survival and reproduction (required)
Test Acceptability:	80% or greater survival of all control organisms and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control females must produce three broods. (required)
Sampling Requirements:	Minimum of three samples with a maximum holding time of 36 hours before first use. (required)
Sample volume required:	1 L/Day (recommended)

Pimephales promelas

Test type:	Modified Chronic Static Renewal Freshwater Test
Test Reference Manual:	EPA-821-R-02-013 "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms"
Test Method:	*Pimephales promelas* Survival and Growth Test - EPA 1000.0
Temperature:	25 ˚C ± 1˚C (Temperatures should not deviate by more than 3˚C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	600 mL (500 mL is recommended minimum)
Test solution volume:	250 mL (recommended minimum)
Renewal of Test Solutions:	Daily (required)
Age of Test Organisms:	Newly hatched larvae less than 24 hours old (required)
Number of Organisms Per Test Chamber:	10 (recommended)
Number of Replicate Test Chambers Per Treatment:	4 (required minimum)
Number of Organisms Per Test Concentration:	40 (required minimum)
Feeding Regime:	Feed 0.15 g of a concentrated suspension of newly hatched brine shrimp nauplii twice daily, 6 h between feedings (at the beginning of the work day prior to renewal, and at the end of the work day following renewal). Sufficient *Artemia* are added to provide an excess.
Cleaning:	Siphoned daily, immediately before test solution renewal (required)
Aeration:	None, unless DO concentration falls below 4.0 mg/L, at which point the rate should not exceed 100 bubbles/minute. (recommended)
Test Duration:	7 days (required)
Endpoints:	Survival and growth (weight) (required)
Test Acceptability:	80% or greater survival in controls; average dry weight per surviving organism in control chambers equals or exceeds 0.25 mg (required)
Sampling Requirements:	Minimum of three samples with a maximum holding time of 36 hours before first use. (required)
Sample volume required:	2.5 L/Day (recommended)

CERIODAPHNIA DUBIA
DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT:	Pine Brook Country Club	*C.dubia* TEST ID #	19-970a
ADDRESS:	42 Newton Street	CHAIN OF CUSTODY #	C39-2767/68
	Weston, MA 02193	NEB PROJECT #	05.0752101.00
PERMITTEE:	Pine Brook Country Club	SAMPLE ID:	Effluent
PERMIT NUMBER:	MA0032212		
DILUTION WATER:	Laboratory Soft Water		

INVERTEBRATES

TEST SET-UP TECHNICIAN:	PD
TEST SPECIES:	*Ceriodaphnia dubia*
NEB LOT #	Cd19 (RMH 157)
AGE:	< 24 hours
TEST SOLUTION VOLUME (mls):	15
ORGANISMS PER TEST CHAMBER:	1
ORGANISMS PER CONCENTRATION:	10

LABORATORY CONTROL WATER (SRCF)

Lot Number	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$
C39-S017	50	35

	DATE	TIME
TEST START:	7/22/19	1422
TEST END:	7/28/19	1357

COMMENTS: _____

REVIEWED BY: _____ DATE: 8/20/19

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193		
NEB PROJECT NUMBER:	05.0752101.00	NEB TEST NUMBER: 19-970a	COC # C39-2767/68
TEST ORGANISM:	*Ceriodaphnia dubia*	AGE: <24 hours	Lot # Cd19 (RMH 157)
START DATE: 7/22/19	TIME: 1422	END DATE: 7/28/19	TIME: 1357

Effluent Concentration	Culture Lot# Cd19 (RMH 157) Cup # / Day Number / Replicate	A1 / A	A2 / B	A3 / C	A4 / D	A5 / E	A6 / F	A7 / G	A8 / H	A9 / I	A10 / J	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
NEB Lab Diluent	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	PD	
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	CH	
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	CW	
	3	✓	✓	4	✓	✓	✓	6	5	✓	✓	15	10	CH	CH
	4	5	4	✓	5	3	4	✓	✓	8	6	35	10	CW	CW
	5	12	12	11	4	10	8	8	10	13	4	92	10	CW	CW
	6	10	✓	18	12	12	10	16	10	20	6	114	10	CW	CW
	7														
	totals	27	16	33	21	25	22	30	25	41	16	256	10		MC
Pine Brook Control		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	3	1	✓	4	4	✓	✓	✓	✓	12	10		
	4	5	✓	✓	✓	✓	✓	✓	✓	5	✓	10	10		
	5	9	8	4	1	9	8	11	6	✓	12	68	10		
	6	8	✓	9	12	10	8	10	6	8	✓	71	10		
	7														
	totals	22	11	14	13	23	20	21	12	13	12	161	10		
6.25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	7	1	✓	✓	✓	✓	✓	5	✓	✓	13	10		
	4	✓	7	5	6	8	6	4	✓	6	7	49	10		
	5	13	7	10	✓	11	11	8	15	12	14	101	10		
	6	17	3	✓/x	1	10	13	8	15	12	6	85	9		
	7														
	totals	37	18	15	7	29	30	20	35	30	27	248	9		

Notes: _____

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193		
NEB PROJECT NUMBER:	05.0752101.00	ORGANISM: *Ceriodaphnia dubia*	START DATE: 7/22/19

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults		
12.5%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	6	3	6	4	✓	5	4	5	✓	✓	33	10		
	4	✓	✓	✓	✓	8	✓	1	✓	6	7	22	10		
	5	14	12	12	14	13	13	12	13	14	16	133	10		
	6	23	17	20	16	15	20	14	17	20	20	182	10		
	7														
	totals	43	32	38	34	36	38	31	35	40	43	370	10		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	6	5	✓	✓	✓	4	6	6	✓	32	10		
	4	✓	✓	✓	7	6	7	✓	✓	✓	7	27	10		
	5	15	12	13	14	12	14	✓	13	14	13	120	10		
	6	20	18	18	14	15	18	10	21	18	18	170	10		
	7														
	totals	40	36	36	35	33	39	14	40	38	38	349	10		
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	5	6	3	5	5	5	5	4	6	49	10		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	5	16	14	12	14	14	10	12	14	12	16	134	10		
	6	18	21	20	21	20	17	18	18	6	10	169	10		
	7														
	totals	39	40	38	38	39	32	35	37	22	32	352	10		
100%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓/x	✓	✓	✓	0	9		
	2	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	0	9		
	3	6	7	6	6	5	5	X	6	✓	5	46	9		
	4	✓	✓	✓	✓	✓	✓	X	✓	6	✓	6	9		
	5	14	16	11	15	14	15	X	17	15	16	133	9		
	6	21	20	18	18	16	21	X	22	18	20	174	9		
	7														
	totals	41	43	35	39	35	41	0	45	39	41	359	9		

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	21-0230-2634	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	21-2667-7965	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:22	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 13:57	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	08-1092-6824	**Code:**	3055C2E8	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	502123	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Dev**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
6.25		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
12.5		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
25		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
50		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
100		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10	0.9	10.0%

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000

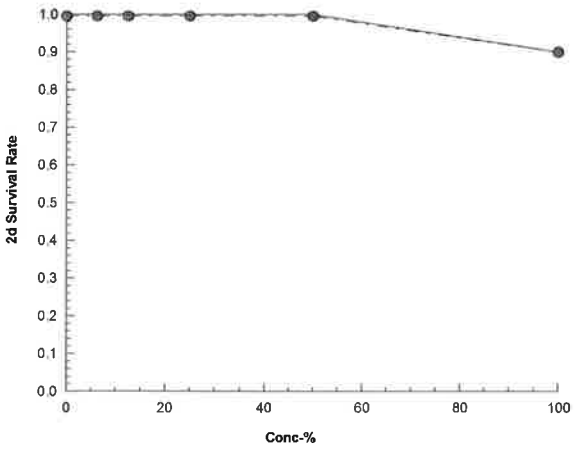
2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	21-0230-2634	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	09-9080-2849	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	21-2667-7965	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:22	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 13:57	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	08-1092-6824	**Code:**	3055C2E8	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1962221	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

6d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
6.25		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10	0.975	2.5%
12.5		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	0.975	2.5%
25		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	0.975	2.5%
50		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	0.975	2.5%
100		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10	0.9	10.0%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000

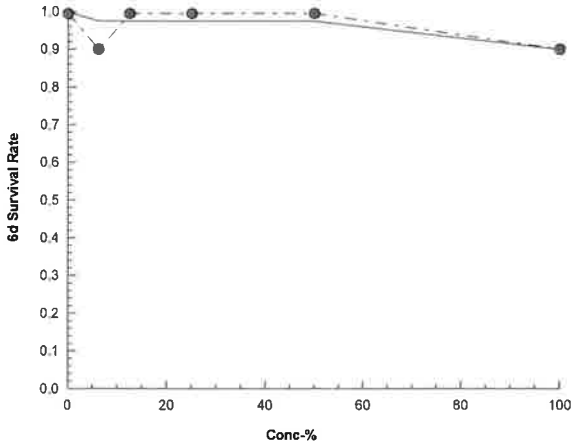
6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **New England Bioassay**

Analysis ID:	09-9080-2849	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	01-1364-2522	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:49	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	21-2667-7965	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:22	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 13:57	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	08-1092-6824	**Code:**	3055C2E8	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	970003	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	25.6	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Dev**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	10	25.6	16	41	7.691	30.04%	0.0%	32.23	0.0%
6.25		10	24.8	7	37	9.496	38.29%	3.13%	32.23	0.0%
12.5		10	37	31	43	4.19	11.32%	-44.53%	32.23	0.0%
25		10	34.9	14	40	7.68	22.01%	-36.33%	32.23	0.0%
50		10	35.2	22	40	5.432	15.43%	-37.5%	32.23	0.0%
100		10	35.9	0	45	13	36.21%	-40.23%	32.23	0.0%

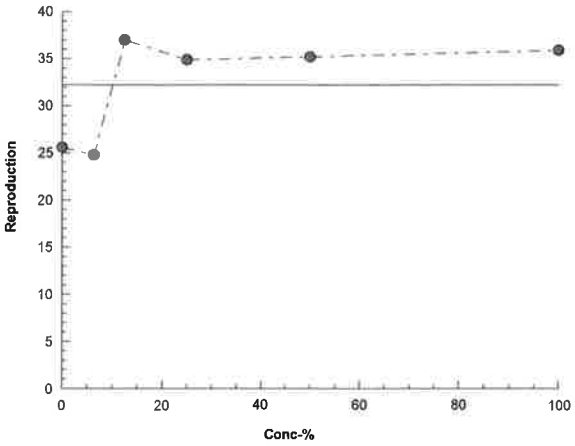
Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	27	16	33	21	25	22	30	25	41	16
6.25		37	18	15	7	29	30	20	35	30	27
12.5		43	32	38	34	36	38	31	35	40	43
25		40	36	36	35	33	39	14	40	38	38
50		39	40	38	38	39	32	35	37	22	32
100		41	43	35	39	35	41	0	45	39	41

Ceriodaphnia 7-d Survival and Reproduction Test **New England Bioassay**

Analysis ID:	01-1364-2522	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:49	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	05-2797-6577	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	21-2667-7965	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:22	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 13:57	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	08-1092-6824	**Code:**	3055C2E8	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	0.5000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	0.5000	Exact	1.0000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1	0	0.0%
6.25		9	1	10	0.9	0.1	10.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		9	1	10	0.9	0.1	10.0%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000

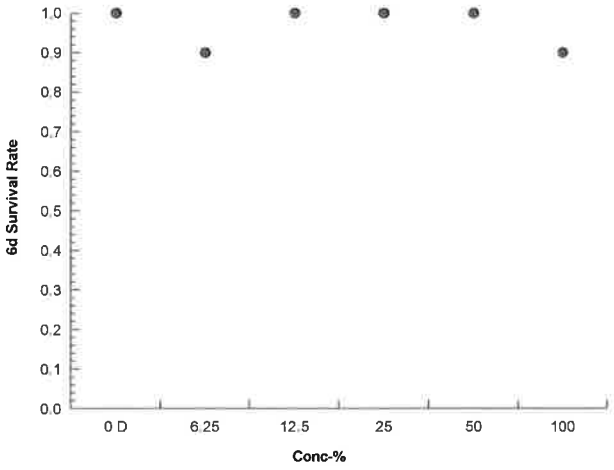
6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **New England Bioassay**

Analysis ID:	05-2797-6577	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-4767-1651	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:49	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-2667-7965	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:22	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 13:57	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	6d	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	08-1092-6824	**Code:**	3055C2E8	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	33.63%

Steel Many-One Rank Sum Test

Control vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water	6.25	105.5	75	2	18	Asymp	0.8444	Non-Significant Effect
	12.5	145	75	0	18	Asymp	1.0000	Non-Significant Effect
	25	135.5	75	1	18	Asymp	0.9999	Non-Significant Effect
	50	137.5	75	1	18	Asymp	1.0000	Non-Significant Effect
	100	139.5	75	1	18	Asymp	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	25.6	15	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1513.33	302.667	5	4.279	0.0024	Significant Effect
Error	3819.4	70.7296	54			
Total	5332.73		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	13.06	15.09	0.0228	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8528	0.9459	3.7E-06	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	25.6	20.1	31.1	25	16	41	2.432	30.04%	0.00%
6.25		10	24.8	18.01	31.59	28	7	37	3.003	38.29%	3.13%
12.5		10	37	34	40	37	31	43	1.325	11.32%	-44.53%
25		10	34.9	29.41	40.39	37	14	40	2.429	22.01%	-36.33%
50		10	35.2	31.31	39.09	37.5	22	40	1.718	15.43%	-37.50%
100		10	35.9	26.6	45.2	40	0	45	4.111	36.21%	-40.23%

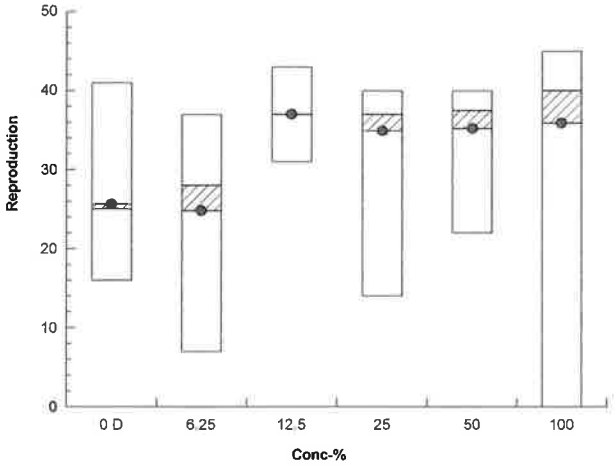
Reproduction Detail

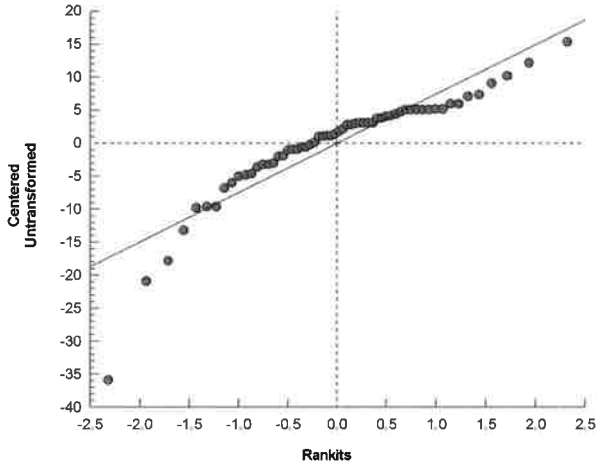
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	27	16	33	21	25	22	30	25	41	16
6.25		37	18	15	7	29	30	20	35	30	27
12.5		43	32	38	34	36	38	31	35	40	43
25		40	36	36	35	33	39	14	40	38	38
50		39	40	38	38	39	32	35	37	22	32
100		41	43	35	39	35	41	0	45	39	41

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-4767-1651	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Aug-19 13:49	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193							
NEB PROJECT NUMBER:	05.0752101.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	Laboratory Soft Water			START DATE:			7/22/19 TIME:	1422
ANALYST	CW	BA	KO	AS	CW	BA		
NEB Lab Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.7	25.6	26.0	25.6	25.9	25.8		
D.O. mg/L Initial	8.2	8.1	8.1	8.1	8.2	8.2		
pH s.u. Initial	7.7	7.8	7.4	7.7	7.5	7.8		
Conductivity µS Initial	196	196	196	195	195	194		
Temp °C Final	25.8	25.6	24.0	25.2	25.4	25.6		
D.O. mg/L Final	8.0	8.2	7.5	8.3	8.2	8.1		
pH s.u. Final	7.8	7.8	7.6	7.5	7.8	7.8		
Conductivity µS Final	202	205	208	203	208	203		
Pine Brook Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.5	25.8	26.0	25.7	24.5	26.6		
D.O. mg/L Initial	8.8	8.3	8.8	8.9	8.6	9.3		
pH s.u. Initial	7.3	7.4	7.4	7.4	7.0	7.0		
Conductivity µS Initial	608	608	393	391	580	580		
Temp °C Final	26.0	25.7	24.1	25.3	25.3	25.7		
D.O. mg/L Final	8.0	8.2	7.4	8.2	8.2	8.0		
pH s.u. Final	7.7	7.7	7.4	7.5	7.8	7.4		
Conductivity µS Final	603	603	407	403	260	583		
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.7	26.0	25.5	25.7	25.9		
D.O. mg/L Initial	8.5	8.1	8.1	8.3	8.3	8.2		
pH s.u. Initial	7.5	7.6	7.4	7.5	7.5	7.5		
Conductivity µS Initial	252	252	254	250	250	245		
Temp °C Final	25.9	25.8	24.1	25.3	25.3	25.8		
D.O. mg/L Final	8.0	8.2	7.4	8.2	8.2	7.9		
pH s.u. Final	7.8	7.9	7.5	7.5	7.9	7.5		
Conductivity µS Final	271	266	268	277	312	258		
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.8	25.7	26.0	25.5	25.9	25.9		
D.O. mg/L Initial	8.3	8.1	8.0	8.1	8.3	8.3		
pH s.u. Initial	7.5	7.7	7.4	7.8	7.6	7.6		
Conductivity µS Initial	301	298	307	306	304	310		
Temp °C Final	25.8	25.8	24.1	25.3	25.3	25.7		
D.O. mg/L Final	7.9	8.2	7.4	8.1	8.2	7.9		
pH s.u. Final	7.8	7.9	7.5	7.6	8.0	7.5		
Conductivity µS Final	308	302	316	314	429	318		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193							
NEB PROJECT NUMBER:	05.0752101.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	Laboratory Soft Water			START DATE:			7/22/19 TIME:	1422
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.8	25.6	26.0	25.4	25.7	25.8		
D.O. mg/L Initial	8.2	8.2	8.0	8.2	8.3	8.3		
pH s.u. Initial	7.5	7.7	7.4	7.9	7.6	7.6		
Conductivity µS Initial	412	410	422	427	423	418		
Temp °C Final	25.9	25.8	24.1	25.3	25.3	25.7		
D.O. mg/L Final	7.9	8.2	7.5	8.2	8.2	8.0		
pH s.u. Final	7.8	7.9	7.6	7.7	8.2	7.6		
Conductivity µS Final	412	413	432	430	424	423		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.6	26.0	25.1	25.4	25.7		
D.O. mg/L Initial	8.3	8.3	7.8	8.3	8.4	8.4		
pH s.u. Initial	7.5	7.7	7.4	7.9	7.7	7.7		
Conductivity µS Initial	619	615	654	648	632	639		
Temp °C Final	25.9	25.9	24.1	25.4	25.3	25.7		
D.O. mg/L Final	8.0	8.2	7.4	8.2	8.2	8.0		
pH s.u. Final	7.9	8.0	7.7	7.9	8.2	7.7		
Conductivity µS Final	617	616	661	649	642	645		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.4	26.0	24.8	25.3	25.5		
D.O. mg/L Initial	9.1	8.8	6.8	8.5	8.5	9.0		
pH s.u. Initial	7.5	7.7	7.5	7.8	7.8	7.6		
Conductivity µS Initial	831	1,033	1,086	1,081	1,059	1,059		
Temp °C Final	26.0	25.8	24.0	25.4	25.3	25.7		
D.O. mg/L Final	8.0	8.2	7.5	8.2	8.2	8.0		
pH s.u. Final	8.2	8.3	8.0	8.4	8.4	8.1		
Conductivity µS Final	975	1,026	1,088	1,074	1,052	1,054		

Table of Random Permutations of 16

C.dubia Test ID# 19-970a

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16

																				conc
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10

																reps			
1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9	15	11	3	11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
10	16	4	5	12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3	10	16	16	13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
11	13	9	13	4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12	5	10	7	2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
8	9	8	10	6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2

13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5	14	4	6	8	2	15	1	13	14	16	4	15	4	3	12	12	1	4	7
2	2	2	15	14	16	9	12	16	6	10	15	14	9	10	1	14	8	8	16
7	12	15	8	12	3	5	14	7	12	5	13	16	1	7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15	11	8	9	7	12	8	7	1	15	9	3	3	7	13	11	10	4	5	1
11	6	6	1	4	1	3	16	12	5	4	9	13	13	6	8	15	9	1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9	7	14	2	6	4	14	10	9	8	15	10	7	10	9	10	6	14	10	11
12	1	9	10	15	5	2	15	10	2	14	2	8	2	4	13	8	5	15	5
3	3	12	11	5	9	6	6	3	10	13	12	9	6	2	15	7	15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

Ceriodaphnia dubia Culture Chart

Lot # Cd19(RMH 157) A

Brood mother source: RMH 147 B.1 Source's brood size: 22 (Qty.)

Pinebrook 7.22-19

Tech	AH	KF	KF	AH		KF	AH								
Date	7-16	7-17	7-18	7-19		7-21	7-22								
Day acc.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cup # 1	N	N	N	6		15	T1 Y 20		1						
2	N	N	N	5		13	T2 Y 20		2						
3	N	N	N	5		15	T3 Y 19		3						
4	N	N	N	6		15	T4 Y 21		4						
5	N	N	N	5		13	T5 Y 18		5						
6	N	N	N	7		13	T6 Y 19		6						
7	N	N	N	7		14	T7 Y 21		7						
8	N	N	N	5		15	T8 Y 22		8						
9	N	N	N	6		11	T9 Y 18		9						
10	N	N	N	6		16	T10 Y 22		10						
11	N	N	N	5		15	Y		11						
12	N	N	N	5		10	Y		12						
13	N	N	N	4		13	Y		13						

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*, H_2O type used w/ renewal **this** day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
07S2101	T	Y	7-21-19/1600 → 7-21-19/1920	7-22-19/1215
	T			
	T			
	T			
	T			
	T			

PIMEPHALES PROMELAS
DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT:	Pine Brook Country Club	*P.promelas* TEST ID #	19-970b
ADDRESS:	42 Newton Street	CHAIN OF CUSTODY #	C39-2767/68
	Weston, MA 02193	NEB PROJECT #	05.0752101.00
PERMITTEE:	Pine Brook Country Club	SAMPLE ID:	Effluent
PERMIT NUMBER:	MA0032212		
DILUTION WATER:	Laboratory Soft Water		

VERTEBRATES

TEST SET-UP TECHNICIAN:	BA
TEST SPECIES:	*Pimephales promelas*
NEB LOT #	Pp19(7-22)
AGE:	< 24 hours
TEST SOLUTION VOLUME (mls):	400
ORGANISMS PER TEST CHAMBER:	10
ORGANISMS PER CONCENTRATION:	40

LABORATORY CONTROL WATER (SRCF)

Lot Number	Hardness mg/L	Alkalinity mg/L
C39-S017	50	35

	DATE	TIME
TEST START:	7/22/19	1429
TEST END:	7/29/19	1255

COMMENTS: _____

REVIEWED BY: _____ DATE: 8/20/19

NEB'S SURVIVAL DATA SHEET FOR FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193						
NEB PROJECT NUMBER:	05.0752101.00	TEST NUMBER:	19-970b	COC #	C39-2767/68		
TEST ORGANISM:	*Pimephales promelas*	AGE:	<24 hours	Lot #	Pp19(7-22)		
START DATE:	7/22/19	TIME:	1429	END DATE:	7/29/19	TIME:	1255

Effluent Concentration	Replicate Number	Number of Survivors								
		Day								
		0	1	2	3	4	5	6	7	Remarks
	ANALYST	BA	KW	BA	AS	BA	BA	BA	LS	
NEB Lab Synthetic Diluent	A	10	10	10	10	9	8	8	7	
	B	10	10	10	10	10	10	9	9	
	C	10	10	10	10	10	10	10	9	
	D	10	10	10	10	10	10	10	10	
Pine Brook Control	A	10	10	10	5	1	0	0	0	
	B	10	10	10	0	0	0	0	0	
	C	10	10	10	1	0	0	0	0	
	D	10	10	10	8	1	1	1	1	
6.25%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
12.5%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
25%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
50%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
100%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	9	9	9	9	
	D	10	10	9	9	9	9	9	9	

D.O. concentration fell below 4.0 mg/L, all concentrations were aerated at <100 bubbles/minute as of:

NEW ENGLAND BIOASSAY OBSERVATION DATA FORM

Permittee: Pine Brook Country Club | Test Species: *Pimephales promelas* | Test ID: 19-970b

Test Date: 7/22/19 | Project # 05.0752101.00

Concentration or Dilution	All organisms appear healthy and normal unless noted							
	Day 3 Observations		Date: 7/25/19		Technician: AS			
Lab Diluent	Rep A:		Rep B:		Rep C:		Rep D:	
Brook Control	Rep A:	5 NF	Rep B:	10 NF	Rep C:	9 NF	Rep D:	2 NF
6.25%	Rep A:		Rep B:		Rep C:		Rep D:	
12.5%	Rep A:		Rep B:		Rep C:		Rep D:	
25%	Rep A:		Rep B:		Rep C:		Rep D:	
50%	Rep A:		Rep B:		Rep C:		Rep D:	
100%	Rep A:		Rep B:		Rep C:		Rep D:	
	Day 4 Observations		Date: 7/26/19		Technician: BA			
Lab Diluent	Rep A:	NF	Rep B:		Rep C:		Rep D:	
Brook Control	Rep A:	F	Rep B:		Rep C:		Rep D:	F
6.25%	Rep A:		Rep B:		Rep C:		Rep D:	
12.5%	Rep A:		Rep B:		Rep C:		Rep D:	
25%	Rep A:		Rep B:		Rep C:		Rep D:	
50%	Rep A:		Rep B:		Rep C:		Rep D:	
100%	Rep A:		Rep B:		Rep C:		Rep D:	

F= fungus NF = no fungus SL = slightly lethargic L = lethargic VL = very lethargic TD = tangled in debris MT = missing test organism

TE = technician error (organism accidentally killed by technician) SS = stuck in surface tension DW = dead above water line

NEW ENGLAND BIOASSAY OBSERVATION DATA FORM

Permittee: Pine Brook Country Club | Test Species: *Pimephales promelas* | Test ID: 19-970b

Test Date: 7/22/19 | Project # 05.0752101.00

Concentration or Dilution	All organisms appear healthy and normal unless noted							
	Day 6 Observations		Date: 7/28/19		Technician: BA			
Lab Diluent	Rep A:		Rep B:	NF	Rep C:		Rep D:	
Brook Control	Rep A:		Rep B:		Rep C:		Rep D:	
6.25%	Rep A:		Rep B:		Rep C:		Rep D:	
12.5%	Rep A:		Rep B:		Rep C:		Rep D:	
25%	Rep A:		Rep B:		Rep C:		Rep D:	
50%	Rep A:		Rep B:		Rep C:		Rep D:	
100%	Rep A:		Rep B:		Rep C:		Rep D:	
	Day 7 Observations		Date: 7/29/19		Technician: LS			
Lab Diluent	Rep A:	F	Rep B:		Rep C:	NF	Rep D:	
Brook Control	Rep A:		Rep B:		Rep C:		Rep D:	
6.25%	Rep A:		Rep B:		Rep C:		Rep D:	
12.5%	Rep A:		Rep B:		Rep C:		Rep D:	
25%	Rep A:		Rep B:		Rep C:		Rep D:	
50%	Rep A:		Rep B:		Rep C:		Rep D:	
100%	Rep A:		Rep B:		Rep C:		Rep D:	

F= fungus NF = no fungus SL = slightly lethargic L = lethargic VL = very lethargic TD = tangled in debris MT = missing test organism

TE = technician error (organism accidentally killed by technician) SS = stuck in surface tension DW = dead above water line

NEW ENGLAND BIOASSAY WEIGHT DATA FOR FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193		
NEB PROJECT #	05.0752101.00	NEB TEST NUMBER:	19-970b
TEST START DATE	7/22/19	WEIGHING DATE:	8/9/19
TEST END DATE	7/29/19		
DRYING TEMPERATURE (°C)	100 ± 4	DRYING TIME:	minimum 6 hours
ANALYST-INITIAL WEIGHTS	BA	ANALYST-FINAL WEIGHTS	AS

Effluent Concentration	Replicate Number	A Weight of boat (mg)	B Dry Weight: Foil and Larvae (mg)
NEB Lab Synthetic Diluent	A	936.78	941.71
	B	932.86	939.08
	C	938.75	945.22
	D	934.96	940.94
Pine Brook Control	A	935.05	N/A
	B	934.98	N/A
	C	937.72	N/A
	D	927.95	929.45
6.25%	A	928.78	935.40
	B	924.51	931.76
	C	931.51	938.28
	D	926.60	933.66
12.5%	A	926.88	933.71
	B	928.62	935.44
	C	927.28	933.73
	D	928.65	934.83
25%	A	925.25	932.67
	B	925.78	933.01
	C	932.28	939.83
	D	930.36	937.83
50%	A	932.58	939.61
	B	925.16	932.31
	C	928.04	935.25
	D	924.30	929.87
100%	A	924.62	931.95
	B	926.02	933.34
	C	932.61	939.41
	D	936.61	943.24

Concentration	Rep	Final Weight (mg)	Initial Weight (mg)	Total Weight (mg)	Average per fish (mg)	Mean fish weight (mg)	Standard Deviation
NEB Lab Synthetic Diluent	1	941.71	936.78	4.93	0.493	0.5900	0.067690472
	2	939.08	932.86	6.22	0.622		
	3	945.22	938.75	6.47	0.647		
	4	940.94	934.96	5.98	0.598		
Pine Brook Control	1	0.00	0.00	0.00	0.000	0.0375	0.075
	2	0.00	0.00	0.00	0.000		
	3	0.00	0.00	0.00	0.000		
	4	929.45	927.95	1.50	0.150		
6.25%	1	935.40	928.78	6.62	0.662	0.6925	0.028337255
	2	931.76	924.51	7.25	0.725		
	3	938.28	931.51	6.77	0.677		
	4	933.66	926.60	7.06	0.706		
12.5%	1	933.71	926.88	6.83	0.683	0.6570	0.03144307
	2	935.44	928.62	6.82	0.682		
	3	933.73	927.28	6.45	0.645		
	4	934.83	928.65	6.18	0.618		
25%	1	932.67	925.25	7.42	0.742	0.7418	0.013598407
	2	933.01	925.78	7.23	0.723		
	3	939.83	932.28	7.55	0.755		
	4	937.83	930.36	7.47	0.747		
50%	1	939.61	932.58	7.03	0.703	0.6740	0.078358152
	2	932.31	925.16	7.15	0.715		
	3	935.25	928.04	7.21	0.721		
	4	929.87	924.30	5.57	0.557		
100%	1	931.95	924.62	7.33	0.733	0.7020	0.035898004
	2	933.34	926.02	7.32	0.732		
	3	939.41	932.61	6.80	0.680		
	4	943.24	936.61	6.63	0.663		

Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID:	15-6957-2954	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:36	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	06-4674-0994	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 12:55	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Test Length:	5d 22h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** <24
Sample ID:	13-1259-3008	**Code:**	4E3C9470	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1889320	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary — Calculated Variate(A/B) — Isotonic Variate

Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	40/40	1	0.0%
6.25		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	40/40	1	0.0%
12.5		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	40/40	1	0.0%
25		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	40/40	1	0.0%
50		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	40/40	1	0.0%
100		4	0.9750	0.9000	1.0000	0.0500	5.13%	2.5%	39/40	0.975	2.5%

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	0.9000

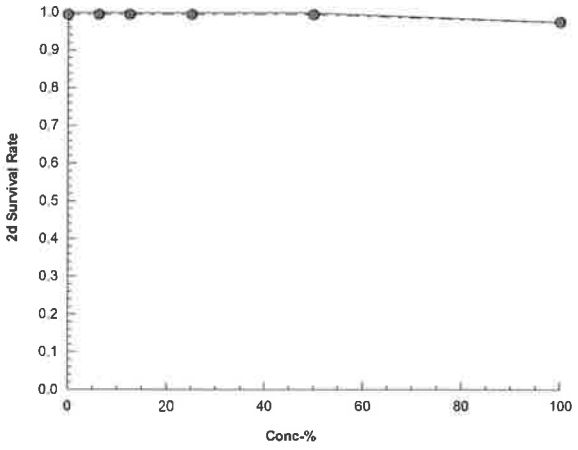
2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	9/10

Fathead Minnow 7-d Larval Survival and Growth Test | **New England Bioassay**

Analysis ID:	15-6957-2954	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:36	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID:	00-5512-8647	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:36	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	06-4674-0994	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 12:55	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Test Length:	5d 22h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** <24
Sample ID:	13-1259-3008	**Code:**	4E3C9470	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1425720	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.875	0.8	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Dev**	**CV%**	**%Effect**	**A/B**	**Mean**	**%Effect**
0	D	4	0.8750	0.7000	1.0000	0.1258	14.38%	0.0%	35/40	0.975	0.0%
6.25		4	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%	40/40	0.975	0.0%
12.5		4	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%	40/40	0.975	0.0%
25		4	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%	40/40	0.975	0.0%
50		4	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%	40/40	0.975	0.0%
100		4	0.9500	0.9000	1.0000	0.0577	6.08%	-8.57%	38/40	0.95	2.56%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.7000	0.9000	0.9000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.9000	0.9000

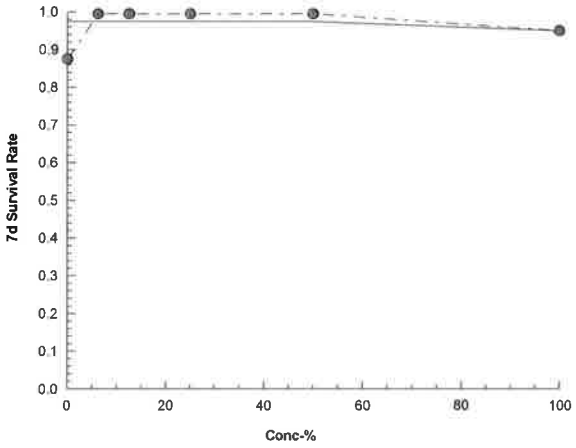
7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	9/10

Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID:	00-5512-8647	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:36	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID:	04-0022-8681	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:37	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	06-4674-0994	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 12:55	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Test Length:	5d 22h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** <24
Sample ID:	13-1259-3008	**Code:**	4E3C9470	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1650277	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.59	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Dev**	**CV%**	**%Effect**	**Mean**	**%Effect**
0	D	4	0.59	0.493	0.647	0.06769	11.47%	0.0%	0.6762	0.0%
6.25		4	0.6925	0.662	0.725	0.02834	4.09%	-17.37%	0.6762	0.0%
12.5		4	0.657	0.618	0.683	0.03144	4.79%	-11.36%	0.6762	0.0%
25		4	0.7417	0.723	0.755	0.0136	1.83%	-25.72%	0.6762	0.0%
50		4	0.674	0.557	0.721	0.07836	11.63%	-14.24%	0.6762	0.0%
100		4	0.702	0.663	0.733	0.0359	5.11%	-18.98%	0.6762	0.0%

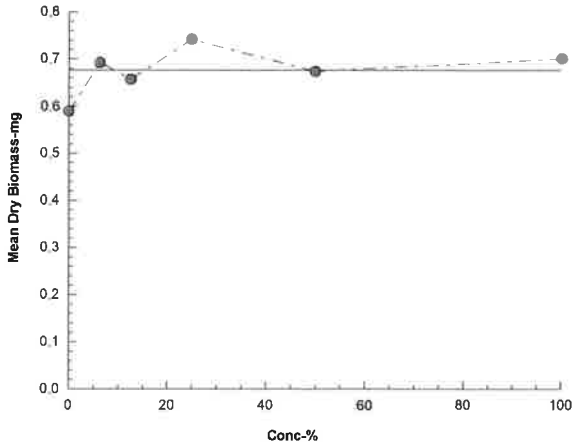
Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.493	0.622	0.647	0.598
6.25		0.662	0.725	0.677	0.706
12.5		0.683	0.682	0.645	0.618
25		0.742	0.723	0.755	0.747
50		0.703	0.715	0.721	0.557
100		0.733	0.732	0.68	0.663

Fathead Minnow 7-d Larval Survival and Growth Test **New England Bioassay**

Analysis ID:	04-0022-8681	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:37	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID:	11-5794-1110	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:37	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-4674-0994	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 12:55	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Test Length:	5d 22h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** <24
Sample ID:	13-1259-3008	**Code:**	4E3C9470	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	>100	n/a	1	10.36%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	24	10	1	6	Asymp	0.9989	Non-Significant Effect
		12.5	24	10	1	6	Asymp	0.9989	Non-Significant Effect
		25	24	10	1	6	Asymp	0.9989	Non-Significant Effect
		50	24	10	1	6	Asymp	0.9989	Non-Significant Effect
		100	21	10	2	6	Asymp	0.9778	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.875	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.118038	0.0236076	5	3.62	0.0193	Significant Effect
Error	0.117373	0.0065207	18			
Total	0.235411		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	5.513	4.248	0.0030	Unequal Variances
Variances	Mod Levene Equality of Variance Test	3.513	4.248	0.0217	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7179	0.884	1.8E-05	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.8750	0.6748	1.0000	0.9000	0.7000	1.0000	0.0629	14.38%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-14.29%
100		4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	-8.57%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.225	0.9485	1.502	1.249	0.9912	1.412	0.08699	14.20%	0.00%
6.25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-15.24%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-15.24%
25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-15.24%
50		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-15.24%
100		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	-8.59%

Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID: 11-5794-1110 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 Aug-19 15:37 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.7000	0.9000	0.9000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	0.9000	0.9000

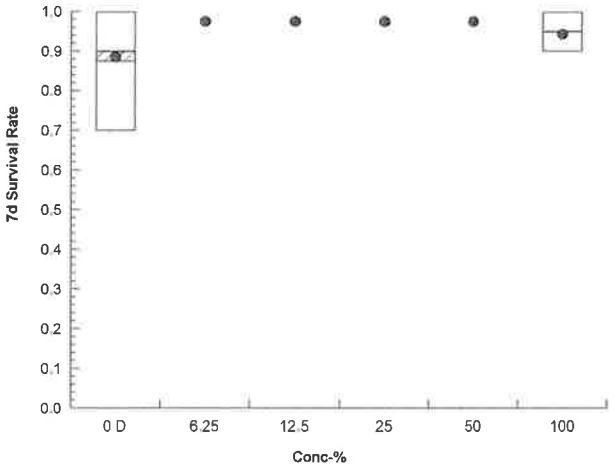
Angular (Corrected) Transformed Detail

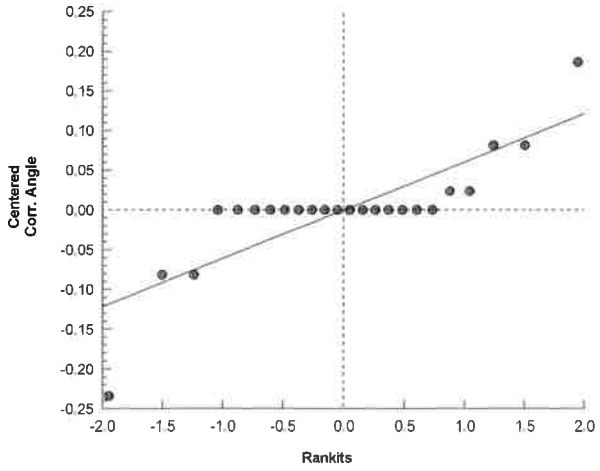
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.9912	1.249	1.249	1.412
6.25		1.412	1.412	1.412	1.412
12.5		1.412	1.412	1.412	1.412
25		1.412	1.412	1.412	1.412
50		1.412	1.412	1.412	1.412
100		1.412	1.412	1.249	1.249

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	7/10	9/10	9/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	9/10	9/10

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **New England Bioassay**

Analysis ID:	01-7843-7455	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-4674-0994	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	22 Jul-19 14:29	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	28 Jul-19 12:55	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Test Length:	5d 22h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** <24
Sample ID:	13-1259-3008	**Code:**	4E3C9470	**Project:**	
Sample Date:	22 Jul-19 09:08	**Material:**	Not Applicable	**Source:**	Pine Brook Country Club (MA0032212
Receipt Date:	22 Jul-19 12:00	**CAS (PC):**		**Station:**	
Sample Age:	5h	**Client:**	Pine Brook Country Club		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	13.93%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water	6.25	-3.002	2.407	0.082	6	CDF	1.0000	Non-Significant Effect
	12.5	-1.962	2.407	0.082	6	CDF	0.9990	Non-Significant Effect
	25	-4.445	2.407	0.082	6	CDF	1.0000	Non-Significant Effect
	50	-2.46	2.407	0.082	6	CDF	0.9998	Non-Significant Effect
	100	-3.281	2.407	0.082	6	CDF	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.59	0.25	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0521286	0.0104257	5	4.472	0.0080	Significant Effect
Error	0.0419623	0.0023312	18			
Total	0.0940909		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	9.046	15.09	0.1072	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.888	0.884	0.0121	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.59	0.4823	0.6977	0.61	0.493	0.647	0.03385	11.47%	0.00%
6.25		4	0.6925	0.6474	0.7376	0.6915	0.662	0.725	0.01417	4.09%	-17.37%
12.5		4	0.657	0.607	0.707	0.6635	0.618	0.683	0.01572	4.79%	-11.36%
25		4	0.7417	0.7201	0.7634	0.7445	0.723	0.755	0.006799	1.83%	-25.72%
50		4	0.674	0.5493	0.7987	0.709	0.557	0.721	0.03918	11.63%	-14.24%
100		4	0.702	0.6449	0.7591	0.706	0.663	0.733	0.01795	5.11%	-18.98%

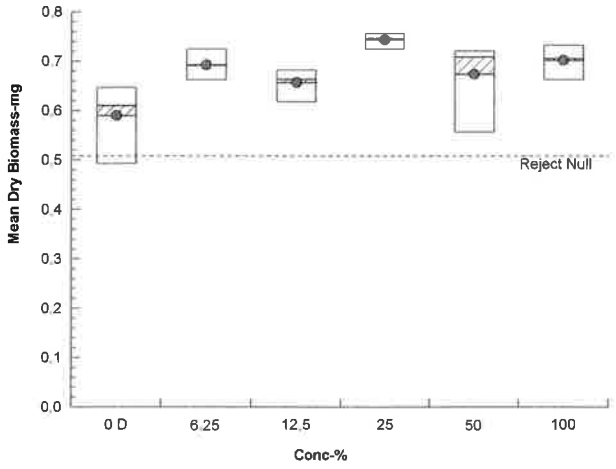
Mean Dry Biomass-mg Detail

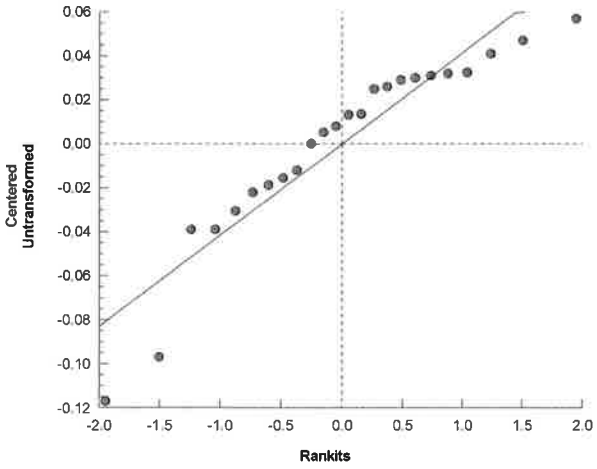
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.493	0.622	0.647	0.598
6.25		0.662	0.725	0.677	0.706
12.5		0.683	0.682	0.645	0.618
25		0.742	0.723	0.755	0.747
50		0.703	0.715	0.721	0.557
100		0.733	0.732	0.68	0.663

Fathead Minnow 7-d Larval Survival and Growth Test **New England Bioassay**

Analysis ID:	01-7843-7455	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 Aug-19 15:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193							
NEB PROJECT NUMBER:	05.0752101.00			TEST ORGANISM			*Pimephales promelas*	
DILUTION WATER SOURCE:	Laboratory Soft Water			START DATE:			7/22/19 TIME:	1429
ANALYST	CW	BA	KO	AS	CW	BA	CW	
NEB Lab Synthetic Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.7	25.6	26.0	25.6	25.9	25.8	25.8	
D.O. mg/L Initial	8.2	8.1	8.1	8.1	8.2	8.2	8.2	
pH s.u. Initial	7.7	7.8	7.4	7.7	7.5	7.8	7.9	
Conductivity µS Initial	196	196	196	195	195	194	196	
Temp °C Final	25.3	25.0	25.3	25.1	25.2	25.2	25.7	
D.O. mg/L Final	7.4	6.8	7.2	7.3	7.2	7.2	6.9	
pH s.u. Final	7.0	7.5	7.7	7.5	7.3	7.3	7.5	
Conductivity µS Final	199	198	211	197	197	199	240	
Pine Brook Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.5	25.8	26.0	25.7	24.5	26.6	25.5	
D.O. mg/L Initial	8.8	8.3	8.8	8.9	8.6	9.3	8.3	
pH s.u. Initial	7.3	7.4	7.4	7.4	7.0	7.0	7.6	
Conductivity µS Initial	608	608	393	391	580	580	581	
Temp °C Final	25.2	25.0	25.3	25.2	25.3	25.3	25.6	
D.O. mg/L Final	7.5	6.7	6.9	6.8	7.0	7.1	7.2	
pH s.u. Final	6.9	7.3	7.4	7.0	7.0	7.0	7.3	
Conductivity µS Final	606	610	424	396	566	588	628	
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.7	26.0	25.5	25.7	25.9	25.6	
D.O. mg/L Initial	8.5	8.1	8.1	8.3	8.3	8.2	8.6	
pH s.u. Initial	7.5	7.6	7.4	7.5	7.5	7.5	7.7	
Conductivity µS Initial	252	252	254	250	250	245	256	
Temp °C Final	25.3	24.4	25.3	25.1	25.4	25.2	25.6	
D.O. mg/L Final	7.1	6.9	7.1	7.2	6.7	7.1	6.7	
pH s.u. Final	7.2	7.4	7.4	7.2	7.2	7.2	7.5	
Conductivity µS Final	254	256	257	253	252	249	295	
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.8	25.7	26.0	25.5	25.9	25.9	25.7	
D.O. mg/L Initial	8.3	8.1	8.0	8.1	8.3	8.3	8.3	
pH s.u. Initial	7.5	7.7	7.4	7.8	7.6	7.6	7.8	
Conductivity µS Initial	301	298	307	306	304	310	307	
Temp °C Final	25.2	24.9	25.4	25.1	25.2	25.3	25.7	
D.O. mg/L Final	7.1	6.9	6.9	7.1	7.1	6.9	6.6	
pH s.u. Final	7.3	7.4	7.4	7.3	7.2	7.2	7.5	
Conductivity µS Final	302	302	310	309	308	315	321	

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston MA 02193							
NEB PROJECT NUMBER:	05.0752101.00			TEST ORGANISM			*Pimephales promelas*	
DILUTION WATER SOURCE:	Laboratory Soft Water			START DATE:			7/22/19 TIME:	1429
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.8	25.6	26.0	25.4	25.7	25.8	25.4	
D.O. mg/L Initial	8.2	8.2	8.0	8.2	8.3	8.3	8.3	
pH s.u. Initial	7.5	7.7	7.4	7.9	7.6	7.6	7.8	
Conductivity µS Initial	412	410	422	427	423	418	416	
Temp °C Final	25.4	25.3	25.3	25.2	25.4	25.3	25.7	
D.O. mg/L Final	7.1	6.0	6.8	6.9	6.7	7.1	6.5	
pH s.u. Final	7.3	7.4	7.4	7.4	7.3	7.3	7.6	
Conductivity µS Final	412	413	425	430	425	424	461	
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.6	26.0	25.1	25.4	25.7	24.9	
D.O. mg/L Initial	8.3	8.3	7.8	8.3	8.4	8.4	8.7	
pH s.u. Initial	7.5	7.7	7.4	7.9	7.7	7.7	7.8	
Conductivity µS Initial	619	615	654	648	632	639	639	
Temp °C Final	25.3	24.8	25.0	25.1	25.3	25.2	25.7	
D.O. mg/L Final	7.3	7.3	7.2	7.1	6.9	7.1	6.9	
pH s.u. Final	7.7	7.7	7.7	7.7	7.5	7.4	7.6	
Conductivity µS Final	618	622	659	654	638	649	657	
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.9	25.4	26.0	24.8	25.3	25.5	24.9	
D.O. mg/L Initial	9.1	8.8	6.8	8.5	8.5	9.0	8.5	
pH s.u. Initial	7.5	7.7	7.5	7.8	7.8	7.6	7.8	
Conductivity µS Initial	831	1,033	1,086	1,081	1,059	1,059	1,061	
Temp °C Final	25.3	25.0	25.1	25.0	25.4	25.3	25.4	
D.O. mg/L Final	7.4	6.8	6.9	7.2	6.5	7.2	7.2	
pH s.u. Final	7.6	7.9	7.9	7.9	7.8	7.7	8.2	
Conductivity µS Final	840	1,014	1,084	1,083	1,062	1,068	1,100	

Table of Random Permutations of 16

P.promelas Test ID# 19-970b

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
										conc									
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
																rep			
1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9	15	11	3	11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
10	16	4	5	12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3	10	16	16	13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
11	13	9	13	4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12	5	10	7	2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
8	9	8	10	6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2
13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5	14	4	6	8	2	15	1	13	14	16	4	15	4	3	12	12	1	4	7
2	2	2	15	14	16	9	12	16	6	10	15	14	9	10	1	14	8	8	16
7	12	15	8	12	3	5	14	7	12	5	13	16	1	7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15	11	8	9	7	12	8	7	1	15	9	3	3	7	13	11	10	4	5	1
11	6	6	1	4	1	3	16	12	5	4	9	13	13	6	8	15	9	1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9	7	14	2	6	4	14	10	9	8	15	10	7	10	9	10	6	14	10	11
12	1	9	10	15	5	2	15	10	2	14	2	8	2	4	13	8	5	15	5
3	3	12	11	5	9	6	6	3	10	13	12	9	6	2	15	7	15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

CHEMICAL ANALYSIS

Please note the subcontract laboratory has its own QAQC and data review processes, and therefore New England Bioassay does not review the analytical results we receive.

PHOENIX
Environmental Laboratories, Inc.

Tuesday, July 30, 2019

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
SDG ID: GCD65927
Sample ID#s: CD65927 - CD65929

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

July 30, 2019

SDG I.D.: GCD65927

Project ID: PINE BROOK COUNTRY CLUB

Client Id	Lab Id	Matrix
EFFLUENT 3 C39-2838	CD65927	WASTE WATER
RECEIVING WATER C39-2839	CD65928	WATER
EFFLUENT GRAB 3	CD65929	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/26/19	9:30
Location Code:	NEB	Received by:	LB	07/26/19	16:10
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD65927
Phoenix ID: CD65927

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT 3 C39-2838

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/30/19	DA	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		07/26/19	9:26
Location Code:	NEB	Received by:	LB	07/26/19	16:10
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD65927
Phoenix ID: CD65928

Project ID: PINE BROOK COUNTRY CLUB
Client ID: RECEIVING WATER C39-2839

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/30/19	DA	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/26/19	9:13
Location Code:	NEB	Received by:	LB	07/26/19	16:10
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD65927
Phoenix ID: CD65929

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT GRAB 3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	0.03	0.02	mg/L	1	07/26/19 18:40	O	SM4500CLG-97
pH	8.05	1.00	pH Units	1	07/27/19 06:00	RR/EG	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 30, 2019

QA/QC Data

SDG I.D.: GCD65927

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 489830 (pH), QC Sample No: CD65831 (CD65929)													
pH			8.13	8.18	0.60	99.2						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489946 (mg/L), QC Sample No: CD65853 (CD65927, CD65928)													
Ammonia as Nitrogen	BRL	0.05	<0.10	<0.10	NC	104			102			90 - 110	20
QA/QC Batch 489723 (mg/L), QC Sample No: CD65852 (CD65929)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	104							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
July 30, 2019

Tuesday, July 30, 2019

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCD65927 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

July 30, 2019 SDG I.D.: GCD65927

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

DW90

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 3.1 Pg of

Data Delivery (check one):
☐ Fax #:
☒ Email: kimberly.wills@gza.com
Format: ☐ Excel ☐ Pdf ☐ Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Pine Brook Country Club (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22525
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	pH (–)	Total Residual Chlorine (0.02 mg/L)	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL As is 120ml	GL Amber 250ml [ ] As is [ ] H2SO4	PL As is 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [ ] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
(25927	Effluent-3 CT39-2838	WW	7/25-26/19	1630-0730	X								1				
(25928	Receiving Water-3 CT39-2839	O	7/26/19	0926	X								1				
(25929	Effluent Grab - 3	WW	7/26/19	0913		X	X			1							

Relinquished by:	Accepted by:	Date:	Time:
	G. [illegible]	7-26-19	1510
	Krystal Hall	7-26-19	1610

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other

* Surcharge Applies

Requirements for CT
☐ Res. Criteria
☐ GW Protection
☐ GA Mobility
☐ GB Mobility
☐ SW Protection
☐ Res. Vol.
☐ Ind. Vol.

Requirements for MA
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MCP Certification
☐ Other

PHOENIX
Environmental Laboratories, Inc.

Tuesday, July 30, 2019

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
SDG ID: GCD62372
Sample ID#s: CD62372 - CD62374

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

July 30, 2019

SDG I.D.: GCD62372

Project ID: PINE BROOK COUNTRY CLUB

Client Id	Lab Id	Matrix
EFFLUENT #1 C39-2767	CD62372	WASTE WATER
PINE BROOK #1 C39-2768	CD62373	WATER
EFF GRAB #1	CD62374	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/22/19	9:08
Location Code:	NEB	Received by:	B	07/22/19	16:36
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD62372
Phoenix ID: CD62372

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT #1 C39-2767

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.084	0.010	mg/L	1	07/24/19	EK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/24/19	RS	SM3113B
Copper	0.0857	0.0010	mg/L	1	07/24/19	EK	E200.7
Hardness (CaCO3)	195	0.1	mg/L	1	07/24/19		E200.7
Nickel	0.005	0.001	mg/L	1	07/24/19	EK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/24/19	RS	SM3113B
Zinc	0.052	0.002	mg/L	1	07/24/19	EK	E200.7
Alkalinity-CaCO3	143	5.00	mg/L	1	07/23/19	RR/EG	SM2320B-11
Conductivity	1040	5.00	umhos/cm	1	07/23/19	RR/EG	SM2510B-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/24/19	KDB	E350.1
Tot. Diss. Solids	610	10	mg/L	1	07/24/19	BMD/BJA	SM2540C-11
Tot. Org. Carbon	6.33	0.50	mg/L	1	07/27/19	RR/EG	SM5310B-11
Total Solids	650	10	mg/L	1	07/24/19	BJA	SM2540B-11
Total Metals Digestion	Completed				07/23/19	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		07/22/19	9:32
Location Code:	NEB	Received by:	B	07/22/19	16:36
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD62372
Phoenix ID: CD62373

Project ID: PINE BROOK COUNTRY CLUB
Client ID: PINE BROOK #1 C39-2768

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.143	0.020	mg/L	1	07/28/19	CPP	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/24/19	RS	SM3113B/SW7010-10
Copper	0.0022	0.0020	mg/L	1	07/28/19	CPP	SW6010D/E200.7
Hardness (CaCO3)	94.8	0.1	mg/L	1	07/29/19		E200.7
Nickel	< 0.001	0.001	mg/L	1	07/29/19	EK	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/24/19	RS	SM3113B/SW7010
Zinc	0.005	0.004	mg/L	1	07/28/19	CPP	SW6010D/E200.7
Alkalinity-CaCO3	45.1	5.00	mg/L	1	07/23/19	RR/EG	SM2320B-11
Conductivity	613	5.00	umhos/cm	1	07/23/19	RR/EG	SM2510B-11
Ammonia as Nitrogen	0.11	0.05	mg/L	1	07/24/19	KDB	E350.1
pH	7.20	1.00	pH Units	1	07/23/19 10:31	RR/EG	SM4500-H B-11
Tot. Org. Carbon	2.85	0.50	mg/L	1	07/27/19	RR/EG	SM5310B-11
Total Metals Digestion	Completed				07/23/19	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 30, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/22/19	9:40
Location Code:	NEB	Received by:	B	07/22/19	16:36
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD62372
Phoenix ID: CD62374

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFF GRAB #1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	0.03	0.02	mg/L	1	07/22/19 19:48	O	SM4500CLG-97
pH	8.01	1.00	pH Units	1	07/23/19 10:39	RR/EG	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 30, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 30, 2019

QA/QC Data

SDG I.D.: GCD62372

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 488568 (mg/L), QC Sample No: CD61234 (CD62372, CD62373)													
Cadmium - Water	BRL	0.0001	0.0099	0.0098	NC	102			89.8			75 - 125	20
QA/QC Batch 488568 (mg/L), QC Sample No: CD61234 (CD62372, CD62373)													
Lead (Furnace) - Water	BRL	0.001	0.024	0.025	4.10	101			110			75 - 125	30
QA/QC Batch 489111 (mg/L), QC Sample No: CD61161 (CD62372)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	0.028	0.031	NC	107	104	2.8	113			75 - 125	20
Copper	BRL	0.0025	0.011	0.0100	NC	108	104	3.8	112			75 - 125	20
Nickel	BRL	0.001				100	112	11.3	99.3			75 - 125	20
Zinc	BRL	0.0020	0.033	0.0322	2.50	99.5	109	9.1	102			75 - 125	20
QA/QC Batch 489115 (mg/L), QC Sample No: CD61829 (CD62373)													
ICP Metals - Aqueous													
Aluminum	BRL	0.020	0.055	0.054	NC	101	102	1.0	103			75 - 125	20
Copper	BRL	0.005	<0.005	0.006	NC	108	110	1.8	109			75 - 125	20
Nickel	BRL	0.001	0.001	<0.001	NC	101	104	2.9	102			75 - 125	20
Zinc	BRL	0.004	<0.004	<0.004	NC	94.8	94.2	0.6	97.4			75 - 125	20

PHOENIX

Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 30, 2019

QA/QC Data

SDG I.D.: GCD62372

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 489052 (mg/L), QC Sample No: CD62003 (CD62372, CD62373)													
Alkalinity-CaCO3	BRL	10.0	74	72	NC	102						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489079 (umhos/cm), QC Sample No: CD62003 (CD62372, CD62373)													
Conductivity	BRL	5.00	610	612	0.30	101						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489067 (pH), QC Sample No: CD62003 (CD62372, CD62373, CD62374)													
pH			7.69	7.77	1.00	99.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489303 (mg/L), QC Sample No: CD62372 (CD62372)													
Total Solids	BRL	10	650	650	0	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489227 (mg/L), QC Sample No: CD62743 (CD62372)													
Tot. Diss. Solids	BRL	10	1200	1200	0	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489822 (mg/L), QC Sample No: CD63366 (CD62372, CD62373)													
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	108			101			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489009 (mg/L), QC Sample No: CD61698 (CD62372, CD62373)													
Ammonia as Nitrogen	BRL	0.05	0.13	0.13	NC	104			96.8			90 - 110	20
Comment:													
TKN is reported as Organic Nitrogen in the Blank, LCS, DUP and MS.													
QA/QC Batch 488912 (mg/L), QC Sample No: CD61828 (CD62374)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	109							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
July 30, 2019

Tuesday, July 30, 2019

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCD62372 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

July 30, 2019 SDG I.D.: GCD62372

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Cooler: Yes ☒ No ☐ Coolant: IPK ☐ ICE ☐ No ☐
Temp 2.1 °C Pg of

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☒ Email: Kimberly.wills@gza.com

Customer: NEB - a Div. of GZA
Address: 77 Batson Drive, Manchester, CT 06042

Project: Pine Brook Country Club
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O: 22525

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness, Alkalinity	Specific conductance	Total suids	Total dissolved solids	Ammonia	TOC	Cd(AA), Pb(AA), Cu, Zn,	Ni, Al	Total Residual chlorine	pH	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml [ ] 1000ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
62372	Effluent Grab #1	WW	7/22/19	1338-0908	X	X	X	X	X	X	X	X			1					1	1	1				
62373	Pine Brook #1	O	7/22/19	0932	X	X			X	X	X	X		X	1					1	1	1				
62374	Eff grab #1	WW	7/22/19	0940									X	X						1						

Relinquished by:	Accepted by:	Date:	Time:
		7-22-19	1615
		7-22-19	16:36

Comments, Special Requirements or Regulations:

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ MWRA eSMART ☐ Other

State where samples were collected: MA

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

PHOENIX
Environmental Laboratories, Inc.

Friday, July 26, 2019

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
SDG ID: GCD64321
Sample ID#s: CD64321 - CD64323

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

July 26, 2019

SDG I.D.: GCD64321

Project ID: PINE BROOK COUNTRY CLUB

Client Id	Lab Id	Matrix
EFFLUENT-2 C39-2798	CD64321	WASTE WATER
RECEIVING WATER-2 C39-2799	CD64322	SURFACE WATER
EFFLUENT GRAB-2	CD64323	WASTE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 26, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/24/19	10:10
Location Code:	NEB	Received by:	SW	07/24/19	17:02
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD64321
Phoenix ID: CD64321

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT-2 C39-2798

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.06	0.05	mg/L	1	07/26/19	DA	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 26, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 26, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	SURFACE WATER	Collected by:		07/24/19	9:40
Location Code:	NEB	Received by:	SW	07/24/19	17:02
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD64321
Phoenix ID: CD64322

Project ID: PINE BROOK COUNTRY CLUB
Client ID: RECEIVING WATER-2 C39-2799

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.12	0.05	mg/L	1	07/26/19	DA	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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Phyllis Shiller, Laboratory Director
July 26, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 26, 2019

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/24/19	9:49
Location Code:	NEB	Received by:	SW	07/24/19	17:02
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22525				

Laboratory Data

SDG ID: GCD64321
Phoenix ID: CD64323

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT GRAB-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/24/19 19:15	O	SM4500CLG-97
pH	8.05	1.00	pH Units	1	07/25/19 09:27	RWR/KDB	SM4500-H B-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 26, 2019
Reviewed and Released by: Helen Geoghegan, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 26, 2019

QA/QC Data

SDG I.D.: GCD64321

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 489441 (pH), QC Sample No: CD64263 (CD64323)													
pH			7.50	7.62	1.60	98.7						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 489413 (mg/L), QC Sample No: CD63719 (CD64321, CD64322)													
Ammonia as Nitrogen	BRL	0.05	0.39	0.34	13.7	100			101			90 - 110	20
QA/QC Batch 489351 (mg/L), QC Sample No: CD64323 (CD64323)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	107							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
July 26, 2019

Friday, July 26, 2019

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCD64321 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

July 26, 2019 SDG I.D.: GCD64321

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

CHAIN OF CUSTODY RECORD

PHOENIX *Environmental Laboratories, Inc.*

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 2.8 Pg of

Data Delivery (check one):
- ☐ Fax #:
- ☒ Email: kimberly.wills@gza.com

Format: ☐ Excel ☐ Pdf ☐ Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive, Manchester, CT 06042

Project: Pine Brook Country Club (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22525
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	pH (-)	Total Residual Chlorine (0.02 mg/L)	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL As is 120ml	GL Amber 250ml [ ] As is [ ] H_2SO_4	PL As is 1000ml	PL H_2SO_4 [X] 250ml [ ] 1000ml	PL HNO_3 [ ] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
64321	Effluent - 1 of 2 C39-2798	WW	7/23-7/24/19	9347-1010	X								1				
64322	Receiving Water - 1 of 2 C39-2799	O	7/24/19	0940	X								1				
64323	Effluent Grab - 1 of 2	WW	7/24/19	0949		X	X			1							

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-24-19	1630
[signature]	Krystal Hall	7-24-19	17:02

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
- ☐ 1 Day*
- ☐ 2 Days*
- ☐ 3 Days*
- ☒ Standard
- ☐ Other

* Surcharge Applies

Requirements for CT
- ☐ Res. Criteria
- ☐ GW Protection
- ☐ GA Mobility
- ☐ GB Mobility
- ☐ SW Protection
- ☐ Res. Vol.
- ☐ Ind. Vol.

Requirements for MA
- ☐ GW-1
- ☐ GW-2
- ☐ GW-3
- ☐ S-1
- ☐ S-2
- ☐ S-3
- ☐ MCP Certification
- ☐ Other

SAMPLE RECEIPT CHEMISTRY
&
CHAIN OF CUSTODY DOCUMENTS

NEW ENGLAND BIOASSAY - INITIAL CHEMISTRY DATA

PERMITTEE: Pine Brook Country Club

NEB JOB # 05.0752101.00

DATE RECEIVED	7/22/19		7/24/19		7/26/19	
SAMPLE TYPE:	EFF #1	BROOK #1	EFF #2	BROOK #2	EFF #3	BROOK #3
COC #	C39-2767	C39-2768	C39-2798	C39-2799	C39-2838	C39-2839
pH (SU)	7.2	6.9	7.3	7.6	7.4	7.2
Temperature (°C)	2.0	2.0	9.1	4.7	2.4, 4.0	4.9
Dissolved Oxygen (mg/L)	8.9	9.5	6.6	9.9	7.9	9.7
Conductivity (µmhos)	1,038	608	1,085	404	1,071	586
Salinity (ppt)	<1	<1	<1	<1	<1	<1
TRC - DPD (mg/L)	0.017	0.014	0.006	0.010	0.010	0.010
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as $CaCO_3$)	192	90	238	56	236	86
Alkalinity (mg/l as $CaCO_3$)	145	45	175	35	160	40
Tech Initials	CH	CH	CH	CH	KO	KO

NOTE: NA = NOT APPLICABLE

Data Reviewed By: [signature] Date Reviewed: 8/20/19

NEW ENGLAND BIOASSAY- CHAIN-OF-CUSTODY

Sample Set #1

EFFLUENT

Sampler: Steven Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X **Composite**
Sample ID: Effluent
Start Date: 7-21-19 Time: 13:38
End Date: 7-22-19 Time: 9:08

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 7-22-19
Time Collected: 9:40

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
X Unchlorinated
_____ Chlorinated

RECEIVING WATER

Sampler: Steven Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X Grab
Sample ID: Pine Brook
Date Collected: 7-22-19
Time Collected: 9:32

Effluent Sampling Location and Procedures:
After sand filter before UV unit
Composite Sampler

Receiving Water Sampling Location and Procedures:
10 Ft upstream of out fall, Grab from stream surface

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	Date: 7-22-19	Time: 9:45
Received By:	Date: 7/22/19	Time: 0945
Relinquished By:	Date: 7/22/19	Time: 1200
Received By:	Date: 7/22/19	Time: 1200

Optional Information

Purchase Order # to reference on invoice: _____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 2.0 °C
Temperature of Receiving Water Upon Receipt at Lab: 2.0 °C

Effluent COC# C39-2767
Receiving Water COC# C39-2768

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSAY- CHAIN-OF-CUSTODY

Sample Set #2

EFFLUENT

Sampler: Steve Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X **Composite**
Sample ID: Effluent
Start Date: 7-23-19 Time: 2347
End Date: 7-24-19 Time: 1006 → Cubtainer said 1010

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 7-24-19
Time Collected: 949

RECEIVING WATER

Sampler: Steve Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X Grab
Sample ID: Pine Brook
Date Collected: 7-24-19
Time Collected: 9:40

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
X Unchlorinated
_____ Chlorinated

Effluent Sampling Location and Procedures:
Composite sampler after sand filter and before UV

Receiving Water Sampling Location and Procedures:
Surface of stream 10 F upstream of outfall, manual grab

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:		Date: 7-24-19	Time: 10:12
Received By:		Date: 7-24-19	Time: 10:12
Relinquished By:		Date: 7-24-19	Time: 11:45
Received By:		Date: 7/24/19	Time: 1145

Optional Information

Purchase Order # to reference on invoice: _____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 9.1 °C
Temperature of Receiving Water Upon Receipt at Lab: 4.7 °C

Effluent COC# C39-2798
Receiving Water COC# C39-2799

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSAY- CHAIN-OF-CUSTODY

Sample Set #3

EFFLUENT

Sampler: Steven Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X **Composite**
Sample ID: Effluent
Start Date: 7/25/19 Time: 10:30
End Date: 7/26/19 Time: 9:00

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 7/26/19
Time Collected: 913

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
X Unchlorinated
_____ Chlorinated

RECEIVING WATER

Sampler: Steven Hansen
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X Grab
Sample ID: Pine Brook
Date Collected: 7-26-19
Time Collected: 926

Effluent Sampling Location and Procedures:
Composite sampler after sand filter before UV

Receiving Water Sampling Location and Procedures:
Surface of Brook 10 FT up stream of outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	Steven Hansen	Date: 7-26-19	Time: 10:25
Received By:	AL	Date: 7/26	Time: 10.25
Relinquished By:	AL	Date: 7/26	Time: 12:40
Received By:	[signature]	Date: 7/26/19	Time: 1240

Optional Information

Purchase Order # to reference on invoice: _____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab 2.4,4.0C
Temperature of Receiving Water Upon Receipt at Lab: 4.9 °C

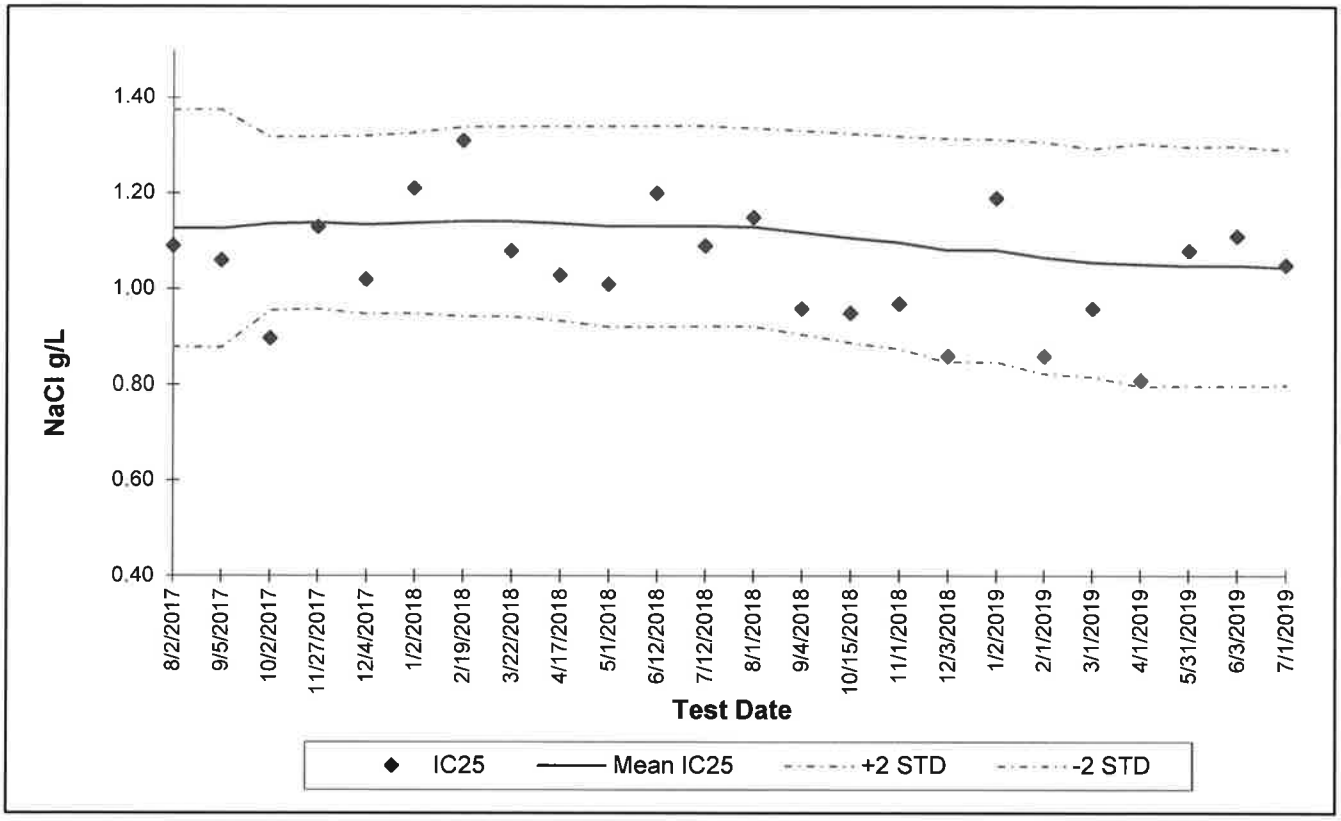
Effluent COC# C39-2838
Receiving Water COC# C39-2839

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

REFERENCE TOXICANT CHARTS

New England Bioassay

Reference Toxicant Data: Sodium chloride (NaCl) *Ceriodaphia dubia* Chronic Reproduction IC_{25}

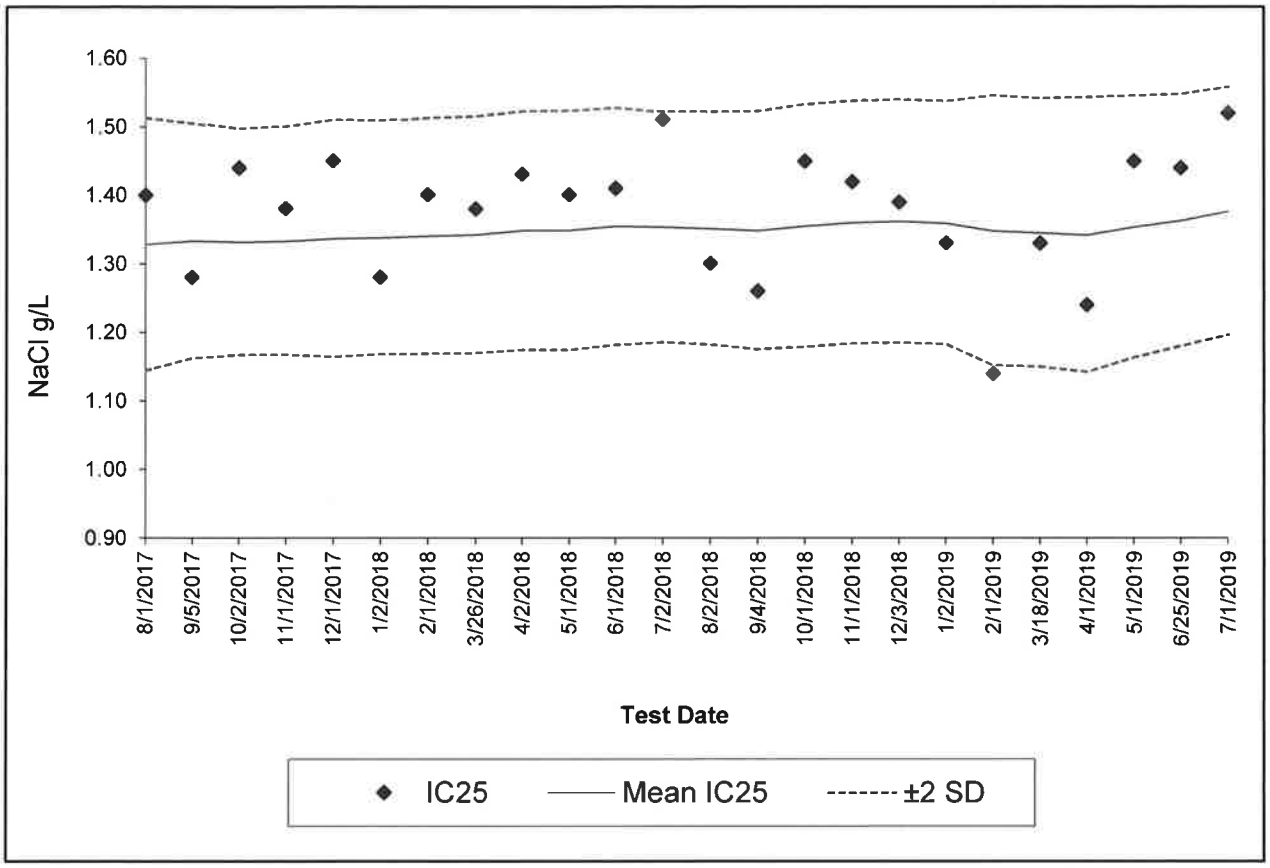


Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	Avg. CV	Repro PMSD (%)	Avg. PMSD (%)
17-1146	8/2/2017	1.09	1.13	0.12	0.88	1.38	0.11	23.94	15.20
17-1317	9/5/2017	1.06	1.13	0.12	0.88	1.38	0.11	33.78	16.13
17-1516	10/2/2017	0.90	1.14	0.09	0.95	1.32	0.08	24.47	16.53
17-1787	11/27/2017	1.13	1.14	0.09	0.96	1.32	0.08	19.97	16.69
17-1846	12/4/2017	1.02	1.13	0.09	0.95	1.32	0.08	14.69	16.60
18-10	1/2/2018	1.21	1.14	0.09	0.95	1.33	0.08	10.81	16.36
18-271	2/19/2018	1.31	1.14	0.10	0.94	1.34	0.09	22.90	16.56
18-416	3/22/2018	1.08	1.14	0.10	0.94	1.34	0.09	17.59	16.88
18-553	4/17/2018	1.03	1.14	0.10	0.93	1.34	0.09	38.54	17.77
18-607	5/1/2018	1.01	1.13	0.10	0.92	1.34	0.09	24.65	18.25
18-816	6/12/2018	1.20	1.13	0.11	0.92	1.34	0.09	46.97	19.59
18-996	7/12/2018	1.09	1.13	0.10	0.92	1.34	0.09	11.41	19.70
18-1103	8/1/2018	1.15	1.13	0.10	0.92	1.34	0.09	17.23	19.67
18-1315	9/4/2018	0.96	1.12	0.11	0.91	1.33	0.10	22.12	20.09
18-1577	10/15/2018	0.95	1.11	0.11	0.89	1.33	0.10	24.32	20.64
18-1625	11/1/2018	0.97	1.10	0.11	0.88	1.32	0.10	31.57	21.34
18-1756	12/3/2018	0.86	1.08	0.12	0.85	1.32	0.11	15.77	21.00
19-8	1/2/2019	1.19	1.08	0.12	0.85	1.31	0.11	40.72	21.30
19-177	2/1/2019	0.86	1.07	0.12	0.82	1.31	0.11	18.71	21.63
19-265	3/1/2019	0.96	1.06	0.12	0.82	1.29	0.11	19.84	22.13
19-403	4/1/2019	0.81	1.05	0.13	0.80	1.30	0.12	10.09	21.85
19-674	5/31/2019	1.08	1.05	0.12	0.80	1.30	0.12	15.59	21.93
19-688	6/3/2019	1.11	1.05	0.12	0.80	1.30	0.12	15.24	22.23
19-926	7/1/2019	1.05	1.04	0.12	0.80	1.29	0.12	12.60	22.23

National 75th Percentile and 90th Percentile CV Averages for Ceriodaphnia Reproduction IC25 (EPA 833-R-00-003): 0.45 - 0.62
PMSD Upper and Lower Bounds for Ceriodaphnia Reproduction (EPA-821-R-02-013): 13% - 47%

New England Bioassay

Reference Toxicant Data: Sodium chloride (NaCl) *Pimephales promelas* 7-day Chronic Growth IC_{25}



Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	Avg. CV	Growth PMSD (%)	Avg. PMSD (%)
17-1147	8/1/2017	1.40	1.33	0.09	1.14	1.51	0.07	11.35	9.91
17-1318	9/5/2017	1.28	1.33	0.09	1.16	1.50	0.06	13.74	10.11
17-1522	10/2/2017	1.44	1.33	0.08	1.17	1.50	0.06	10.36	10.12
17-1696	11/1/2017	1.38	1.33	0.08	1.17	1.50	0.06	9.27	10.08
17-1809	12/1/2017	1.45	1.34	0.09	1.16	1.51	0.06	26.17	10.78
18-11	1/2/2018	1.28	1.34	0.09	1.17	1.51	0.06	6.16	10.59
18-184	2/1/2018	1.40	1.34	0.09	1.17	1.51	0.06	10.52	10.51
18-416	3/26/2018	1.38	1.34	0.09	1.17	1.51	0.06	9.14	10.49
18-472	4/2/2018	1.43	1.35	0.09	1.17	1.52	0.06	6.25	10.57
18-608	5/1/2018	1.40	1.35	0.09	1.17	1.52	0.06	11.80	10.88
18-745	6/1/2018	1.41	1.35	0.09	1.18	1.53	0.06	13.87	11.08
18-919	7/2/2018	1.51	1.35	0.08	1.19	1.52	0.06	12.86	10.83
18-1104	8/2/2018	1.30	1.35	0.08	1.18	1.52	0.06	9.21	10.63
18-1316	9/4/2018	1.26	1.35	0.09	1.18	1.52	0.06	11.89	10.84
18-1512	10/1/2018	1.45	1.36	0.09	1.18	1.53	0.06	8.61	10.76
18-1626	11/1/2018	1.42	1.36	0.09	1.18	1.54	0.06	9.48	10.87
18-1757	12/3/2018	1.39	1.36	0.09	1.18	1.54	0.06	9.70	10.95
19-9	1/2/2019	1.33	1.36	0.09	1.18	1.54	0.07	8.91	11.06
19-178	2/1/2019	1.14	1.35	0.10	1.15	1.54	0.07	6.84	10.94
19-376	3/18/2019	1.33	1.35	0.10	1.15	1.54	0.07	15.36	10.73
19-404	4/1/2019	1.24	1.34	0.10	1.14	1.54	0.07	7.57	10.73
19-541	5/1/2019	1.45	1.35	0.10	1.16	1.54	0.07	7.92	10.62
19-823	6/25/2019	1.44	1.36	0.09	1.18	1.55	0.07	10.75	10.76
19-927	7/1/2019	1.52	1.38	0.09	1.20	1.56	0.07	14.21	10.91

National 75th Percentile and 90th Percentile CV Averages for Fathead Growth IC25 (EPA 833-R-00-003): 0.38 - 0.45
PMSD Upper and Lower Bounds for Fathead Growth (EPA-821-R-02-013): 12% - 30%